

Title	Name	Approval Date
NPB Portfolio Manager	Andrew Broadbent	10/02/2017
Deputy Director for Construction	Erik Johnson	10/02/2017
ESH Manager	Robert Lee	10/02/2017
Quality Assurance Engineer	Joseph Zipper	10/02/2017

Serial No	Part No	Part Rev	ECN	Rev	ECN	Rev
	PD-SST-ES-2000					

Deviation & Waiver: \_\_\_\_\_

OP	Description	Name/Life #	Date	DR
10	TRAVELER INFORMATION			

This traveler shall be used for the installation and testing of end station equipment previously installed and operated at NSLS or another facility, that is now being installed at NSLSII. This traveler goes beyond the typical installation/test traveler that instructs/documents installation qualification. It will also:

- 1) confirm that the re-purposing of this equipment was reviewed and approved for its intended use
- 2) collect upgrade information from subject matter experts (SME) that they deem necessary for the equipment's safe operation at NSLSII, and
- 3) confirm that any new upgrades have been implemented.

**COMPLETE OP#20 THRU OP#130 BEFORE INSTALLATION**

20 A. In the space provided at the top of this traveler write in the relevant beamline.

B. In the space below record the name/description of the end station equipment, and its intended use.

NAME/DESCRIPTION: HAXPES Endstation

INTENDED USE: UHV experimental station  
for x-ray photoelectron and  
absorption spectroscopy

<u>Car White</u> <u>00494</u>	<u>02/02/16</u>	
----------------------------------	-----------------	--



OP	Description	Name/Life #	Date	DR
30	EQUIPMENT RE-PURPOSING REVIEW - This operation shall be signed off by the Lead Beamline Scientist when all concurrences have been obtained.	Brian Wilson Q6498	02/01/18	

The undersigned have inspected the end station equipment and agree to the following:

- It is fit for the intended purpose
- It will be used in a manner in which it was intended
- There is no additional radiation safety risk
- There are no additional vacuum/pressure vessel risks

Concurrence:

Lead Beamline Scientist:

Poet Folio 93-277/18

Program Manager:

Project Manager:

Beamline Engineer:

ESH Manager:

- 40 EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by the Electrical Engineering Group Leader

JR 20624	10/3/17	
----------	---------	--

Inspect the equipment for electrical safety hazards, and complete the following:

☐ The equipment is safe as is and there are no upgrades required.

☒ The following upgrades are required:

PROPER BONDING NEEDED  
FIX EQUIPMENT WIRING - TO PASS EEI

STRAIN RELIEF ISSUES + INADEQUATE LINE CORDS

Note: If there is not enough space provided here please write "See attachment" and reference "OP#40" on the attachment.

CHECK ALL CABLES FOR LISTED/  
APPROVED DURING EEI

PUMP SOLID CABLES  
INADEQUATE -

AWAITING CABLE  
CORDS 1/30/18  
+ ONE EEI CONDITIONAL  
ON SRS 260-100



OP	Description	Name/Life #	Date	DR
50	EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by a Pressure Safety SME	MH9/1 22039	10/3/17	

Inspect the equipment for pressure safety hazards, and complete the following:

☐ The equipment is safe as is and there are no upgrades required.

☒ The following upgrades are required:

see email for details:

water system for R&D needs to be identified

rotating equipment should be covered

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#50' on the attachment.

*need to t.o a way to fill  
LN2 line*

60 EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by a Vacuum Engineer

Rune/18710	10/3/17	
------------	---------	--

Inspect the equipment for vacuum equipment performance, and complete the following:

☐ The equipment is acceptable as is and there are no upgrades required.

☒ The following upgrades are required:

ENSURE VPI VALVES ARE

PROPERLY WIRED TO EDWARDS

ROUGH PUMPS

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#60' on the attachment.

*WORK INSTRUCTIONS FOR  
VACUUM OPERATIONS REVIEWED BY  
VACUUM ENGINEER*



OP	Description	Name/Life #	Date	DR
----	-------------	-------------	------	----

70 EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by a Radiation Safety SME

25809 SUNIL @yad	10/3/17	
---------------------	---------	--

Inspect the equipment for radiation safety hazards, and complete the following:

☐ The equipment is safe as is and there are no upgrades required.

☒ The following upgrades are required:

1. Determine the thickness of the glass windows are sufficient.
2. Determine the thickness of the chamber is sufficient.
3. ~~Identify the beam hit point in the chamber from the transfer line when sample is out.~~

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#70' on the attachment.

(Signature)  
31 Jan 2018

80 EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by the Beamline Engineering Group Leader

Signature 21745	10/3/2017	
--------------------	-----------	--

Inspect the equipment for mechanical safety hazards, and complete the following:

☐ The equipment is safe as is and there are no upgrades required.

☒ The following upgrades are required:

Requirement for Pb/covers windows (viewports)  
to be determined

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#80' on the attachment.



OP	Description	Name/Life #	Date	DR
90	EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by ESH Staff	Lori Stig 19497	10/3/17	

Inspect the equipment for safety hazards, and complete the following:

☐ The equipment is safe as is and there are no upgrades required.

☒ The following upgrades are required:

RGD (x-ray generator) & radiological survey required  
Ladder for LN2 fill needed - not needed UBS 11/29/18  
 RGD not required UBS 11/29/18

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#90' on the attachment.

100	EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by an EPS Controls Engineer	H. Bassam 25677	10/3/17	
-----	---	--------------------	---------	--

Inspect the equipment for EPS upgrades, and complete the following:

☒ The equipment is acceptable as is and there are no upgrades required.

☐ The following upgrades are required:

---



---



---

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#100' on the attachment.



OP	Description	Name/Life #	Date	DR
110	EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by a Mechanical Utilities Engineer	O'BRIEN 24021	10/4/17	

Inspect the equipment for mechanical utility upgrades, and complete the following:

☒ The equipment is acceptable as is and there are no upgrades required.

☐ The following upgrades are required:

---



---



---

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#110' on the attachment.

120 EQUIPMENT UPGRADE INFORMATION - This operation shall be completed by the Survey Group

HUBBARD 20562	11/3/18	
------------------	---------	--

Inspect the equipment for survey/alignment upgrades, and complete the following:

☒ The equipment is acceptable as is and there are no upgrades required.

☐ The following upgrades are required:

---



---



---

Note: If there is not enough space provided here please write "See attachment" and reference 'OP#120' on the attachment.



OP	Description	Name/Life #	Date	DR
130	END STATION DRAWING  A. On the space provided on page 1 for part number record the released drawing number for this end station equipment.  B. Verify that the drawing includes envelope dimensions, location from source, critical interfaces, performance specifications, and upgrade information from the SME's. For clarity purposes the drawing may also include a photo of the equipment but its not required.	Caran Witalan Q6495	01/31/18	
<b>COMPLETE OP#140 THRU OP#250 AFTER INSTALLATION &amp; UPGRADE</b>				
140	Follow the ESH and PPE requirements for the area. Wear safety glasses, safety shoes and gloves for physical installation as applicable	Caran Witalan Q6498	01/31/18	
150	Verify measuring and test equipment used for this procedure contains a valid calibration label in accordance with NSLS-II Calibration Procedure PS-QAP-0901, where applicable.  The technician is responsible for notifying the technical supervisor and/or the cognizant engineer of any discrepancies occurring during the performance of this procedure. All discrepancies shall be identified and reported in accordance with NSLS-II Discrepancy Reporting Procedure PS-QAP-0002.	Caran Witalan Q6498	01/31/18	
160	Verify installation of the end station components per its released drawing.	Caran Witalan Q6498	01/31/18	
170	Verify windows and viewports (overpressure, Be) are installed and compliant with NSLSII requirements	Caran Witalan Q6498	01/31/18	
180	Verify access to the end station and adjacent equipment is acceptable and unimpeded.	Caran Witalan Q6498	01/30/18	



OP	Description	Name/Life #	Date	DR
190	MAGNETIC FIELD SAFETY VERIFICATION - This operation shall be completed by BNL Safety and Health Services Division Personnel	NA Connelly w/blank Q6498	02/04/18	
	A. Measure location of 5 Gauss Line.			
	B. In the space provided below make recommendations on shielding, barricades, and/or signage.			
	C. Confirm recommendations have been installed and are acceptable.			
200	FOR END STATION EQUIPMENT WITH CRYOGENICS	NA Connelly Q6498	02/04/18	
	A. Verify cyro lines are securely supported			
	B. Veriy over pressure relief device is installed.			
210	VACUUM TESTING	Chen H/L Q6498	02/01/18	
	A. Perform vacuum testing as per traveler BL-VA-001.			
	B. Attach completed BL-VA-001 travelers to this traveler.			





OP	Description	Name/Life #	Date	DR
220	<p>UPGRADE INSTALLATION VERIFICATION - This operation shall be signed off by the Lead Beamline Scientist once all signoffs are obtained from the SME's.</p> <p>SME's shall sign-off below that requested upgrades have been installed and are acceptable. If no upgrades were requested then write "N/A".</p> <p>Electrical Engineering Group Leader: <u>[Signature]</u></p> <p>Pressure Safety SME: <u>NA 22039 31 JAN 2018</u></p> <p>Vacuum Engineer: <u>[Signature]</u></p> <p>Radiation Safety SME: <u>[Signature]</u></p> <p>Beamline Engineering Group Leader: <u>[Signature] 29 Jan 2018</u></p> <p>ESH Staff: <u>Loi Stee 1/29/18</u></p> <p>EPS Controls Engineer: <u>NA</u></p> <p>Mechanical Utilities Engineer: <u>NA</u></p> <p>Survey Group: <u>NA</u></p>	<u>[Signature]</u> QB496	01/31/18	
230	<p>SURVEY GROUP</p> <p>A. Survey and align all components per released drawings.</p> <p>B. Attach survey report to this traveler.</p>	<u>[Signature]</u> QB496	1/31/18	
240	<p>Motion Testing with Motion Control System:</p> <p>A. Verify the motion of all motorized axes of the end station components listed above. Also verify the function of travel limits, over-travel limits, encoders, and home switches where applicable.</p> <p>B. Document results and attach test report.</p>	<u>[Signature]</u> QB496	01/31/18	
250	Verify All Traveler Operations Complete	<u>[Signature]</u> QB496	02/02/18	
260	<p>REVISION HISTORY (This step is informational and does not require signoff)</p> <p>Rev - Description - Date</p> <p>C First Release</p>			



## Beamline Vacuum Comp./Sect. Acceptance Testing

Doc No. BL-VA-001 Rev: B

Page 1 of 3

Rev Date: 06/10/2014

Author: Robert Todd

Approved: 06/10/2014

Title	Name	Approval Date
Interface and Beamline Manager	Andrew Broadbent	06/10/2014
ES&H Operations Manager	Lori Stiegler	06/10/2014
CSX Beamline Scientist	Stuart Wilkins	06/10/2014
Quality Assurance Engineer	Joseph Zipper	06/10/2014

Serial No	Part No	Part Rev	ECN	Rev	ECN	Rev
7-L1	VAC SEC 9 HAXPES					
Deviation & Waiver: _____						

OP	Description	Name/Life #	Date	DR
10	Follow the ES&H and Personal Protective Equipment Requirements for the area.	P. Todd / 18710	12/5/17	
15	Verify measuring and test equipment used for this procedure contains a valid calibration label in accordance with NSLS-II Calibration Procedure PS-QAP-0901, where applicable.  The technician is responsible for notifying the technical supervisor and/or the cognizant engineer of any discrepancies occurring during the performance of this procedure. All discrepancies shall be identified and reported in accordance with NSLS-II Discrepancy Reporting Procedure PS-QAP-0002.	P. Todd / 18710	12/5/17	
20	Vacuum Component/Section Information - This step shall be performed by the cognizant beamline engineer/scientist (CE/CS)	C. B. / 06156	1/31/18	

A. Record the Beamline name (in the space provided) at the top of each page of this traveler. (

B. For a vacuum component, record the part number and description on this sheet in the box for "Part No".

C. For a vacuum section, record the section number on this sheet in the box for "Part No"

D. Record required base pressure for Vacuum Comp/Sec.

1.0 x 10<sup>-9</sup> (Torr)

E. Review this entire traveler and if a step (OP#) does not apply, write in that operation's sing-off box: "NA per OP#20"

OP	Description	Name/Life #	Date	DR
30	Configuration- This step shall be performed by the CE/CS.  A. Is component/section in its final configuration? (circle one)  <div style="text-align: center;"> <input checked="" type="radio"/> YES or NO                 </div> B. If "NO", provide a brief description of component/vacuum section  <hr/>	R. Todd / 18710	1/30/18	
40	Visual Inspection Prior to pumping down, visually inspect that all flanges and vacuum connections to component/sector are tight and secure. Confirm the presence of burst disk (as required by the assembly drawing) and inspect for damage. Confirm all vacuum forces are restrained through the use of bolted stands/supports and appropriate bellows restraints. Any deviations from the assembly drawing shall be noted and the Cognizant Beamline Engineer shall be notified prior to proceeding.	R. Todd / 18710	1/30/18	
50	Leak check Leak check component/vacuum section using calibrated He MSLD. Confirm total leak rate < 2x10 <sup>-10</sup> mbar l/sec He.	R. Todd / 18710	1/30/18	
60	RGA scan Acquire RGA data. The CS/CE or Vacuum Engineer (VE) will acquire and interpret RGA and prescribe corrective action if necessary. Initial RGA scan shall include a baseline scan of RGA isolated from vacuum section/component to confirm RGA cleanliness.	NA R. Todd / 18710	1/30/18	
70	Bakeout Confirm that bakeout was performed according to procedure PS-C-XFD-PRC-013 (NSLS-II Beamline Vacuum Bake-Out Procedure) and the manufacturer's requirements with temperature ramp rate(s) soak time(s), soak temperature(s) and maximum temperature(s) all controlled within acceptable limits.	NA R. Todd / 18710	1/30/18	
80	Hot leak check With the component/sector at the soak temperature, perform leak check using calibrated He MSLD. Confirm total leak rate < 2x10 <sup>-10</sup> std cc/sec He (mbar l/sec He).	NA R. Todd / 18710	1/30/18	
90	Crossover to ion pumps Confirm with the Cognizant Beamline Engineer prior to switching from turbopump to ion pump(s). Record the date and time the ion pumps are turned on and the turbopump valved out.	R. Todd / 18710	1/30/18	

Date 1/9/18 Time       



# RE: SST Endstation Traveler Walk Down for HAXPES and Lariat 2 (2 for 5 ES for SST beamline IRR in January 2018)

From: "Gaffney, Michael" <gaffney@bnl.gov>

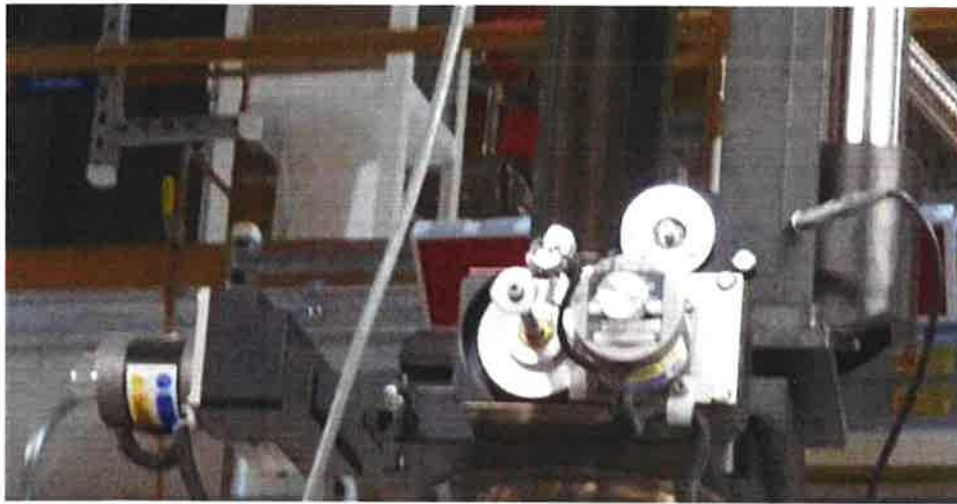
To: "Robinson, Howard" <robinson@bnl.gov>, "Fischer, Daniel" <dfischer@bnl.gov>, "Weiland, Conan" <cweiland@bnl.gov>

Cc: "Stiegler, Lori" <stiegler@bnl.gov>, "O'Brien, William" <wobrien@bnl.gov>, "Zipper, Joseph" <jzipper@bnl.gov>, "Broadbent, Andrew" <broadbent@bnl.gov>

Date: Wed, 4 Oct 2017 16:09:07 +0000 (10/04/2017 12:09:07 PM)

Detailed comments to the HAXPES traveler

Rotating devices need to be covered to prevent accidental contact.

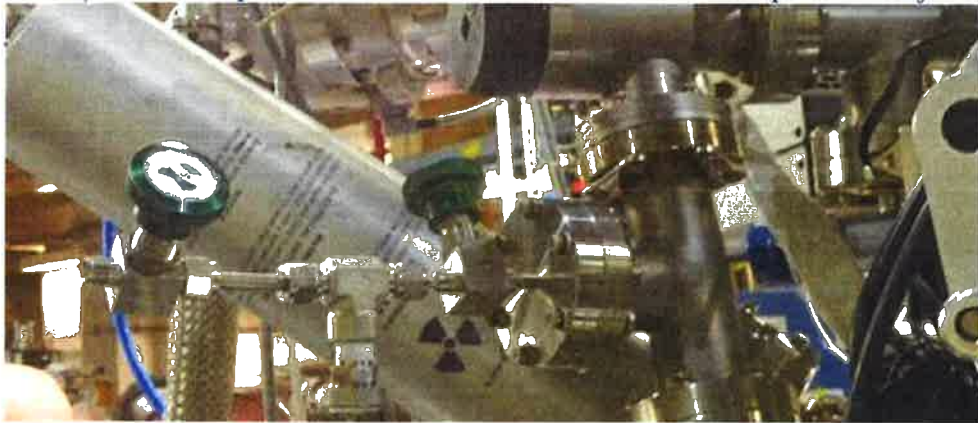


Cooling lines to the RGD specifications need to be identified (pressure/flow rate, etc.) and distribution piping needs to be properly sized.



Prior to installing bleed up gas, ensure an appropriate pressure relieve device is installed. (note: pressure relief device should be tested periodically to verify operation)

installed. (note: pressure relief device should be tested periodically to verify operation).



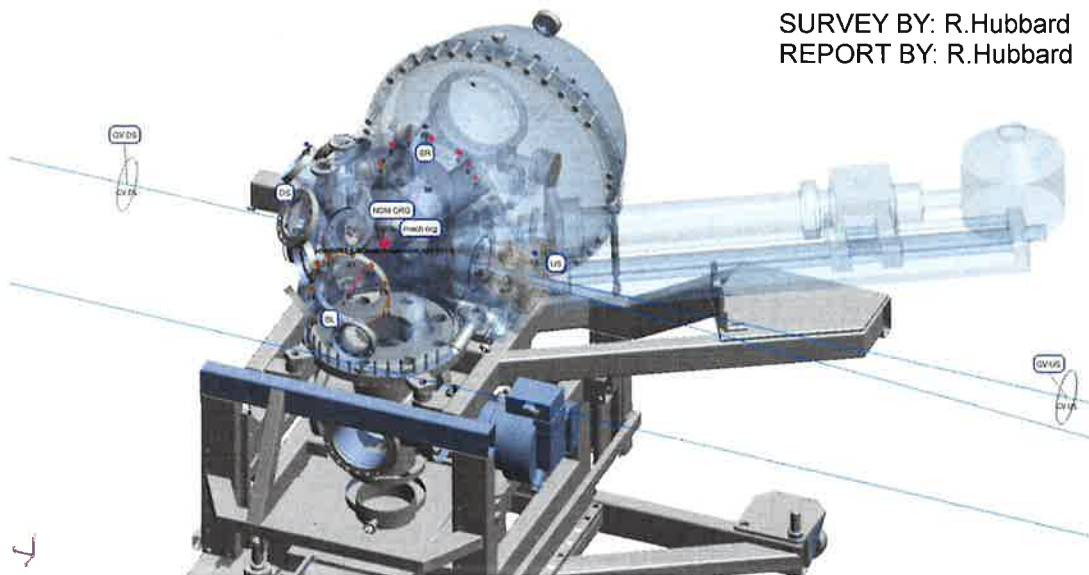
Prior to LN2 use, develop a safe method of filling the system with cryogen at height.



w/r  
Mike Gaffney  
BNL Safety Engineering Group  
[gaffney@bnl.gov](mailto:gaffney@bnl.gov)



SURVEY BY: R.Hubbard  
REPORT BY: R.Hubbard



Frame FRAME&CONTROL::07 ID SST PRACTICAL FRAME			
	X	Y	Z
Translation (mm)	0.000	0.000	0.000
Rotation (deg)	0.0000	0.0000	0.0000
X Axis	1.000000	0.000000	-0.000000
Y Axis	0.000000	1.000000	0.000000
Z Axis	-0.000000	0.000000	1.000000
Proj. Ang.	Rx from Y	Ry from Z	Rz from X
X (deg)	0.0000	90.0000	0.0000
Y (deg)	0.0000	0.0000	90.0000
Z (deg)	90.0000	0.0000	0.0000

Frame HAXPES NOM::HAXPAS NOM			
	X	Y	Z
Translation (mm)	-44.760	15.000	60347.570
Rotation (deg)	-0.0000	0.1329	-0.0000
X Axis	0.999997	-0.000000	-0.002320
Y Axis	0.000000	1.000000	-0.000000
Z Axis	0.002320	0.000000	0.999997
Proj. Ang.	Rx from Y	Ry from Z	Rz from X
X (deg)	-90.0000	90.1329	0.0000
Y (deg)	0.0000	0.0000	90.0000
Z (deg)	90.0000	0.1329	0.0000

Point Group HAXPES::GV3 - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
GV US	-49.410	15.036	58483.102

Point Group HAXPES::GV2 - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
GV DS	-44.051	14.550	61051.302

Point Group HAXPES::asblt org			
Point Name	X (mm)	Y (mm)	Z (mm)
mech org	-44.886	15.231	60349.263

Point Group HAXPES::HAX BR FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
BR	-338.249	16.312	60349.574

Point Group HAXPES::HAX BL FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
BL	177.531	14.492	60349.027

Point Group HAXPES::HAX US FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
US	-45.619	15.334	60088.575

Point Group HAXPES::HAX DS FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
DS	-44.229	15.053	60582.971

# LOCAL HAXPES FRAME

Point Group HAXPES::HAX US FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
US	-0.258	0.334	-258.996

Point Group HAXPES::HAX BL FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
BL	222.287	-0.508	1.972

Point Group HAXPES::HAX BR FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
BR	-293.493	1.312	1.323

Point Group HAXPES::asblt org			
Point Name	X (mm)	Y (mm)	Z (mm)
mech org	-0.130	0.231	1.692

Point Group HAXPES::HAX DS FLNG - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
DS	-0.015	0.053	235.402

Point Group HAXPES::GV2 - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
GV DS	-0.923	-0.450	703.732

Point Group HAXPES::GV3 - Cardinal Pts			
Point Name	X (mm)	Y (mm)	Z (mm)
GV US	-0.325	0.036	-1864.473

Frame HAXPES NOM::HAXPAS NOM			
	X	Y	Z
Translation (mm)	-0.000	0.000	-0.000
Rotation (deg)	-0.0000	0.0000	0.0000
X Axis	1.000000	0.000000	-0.000000
Y Axis	-0.000000	1.000000	-0.000000
Z Axis	-0.000000	-0.000000	1.000000
Proj. Ang.	Rx from Y	Ry from Z	Rz from X
X (deg)	0.0000	90.0000	0.0000
Y (deg)	0.0000	0.0000	90.0000
Z (deg)	90.0000	0.0000	0.0000

DEPARTMENT/DIVISION/PROJECT \_\_\_\_\_

QA CLASSIFICATION: ☐ A1 (CRITICAL/HIGH) ☐ A2 (MAJOR/MODERATE) ☐ A3 (MINOR/LOW) ☐ A4 (NEGLIGIBLE)

PART NAME: SST HAXPES Endstation	
PART NO.: PD-SST-ES-2000	REV.:
PREPARED BY:	DATE:
VENDOR:	P.O. NO.:
QTY. RECD.:	DATE RECD.:

COMMENTS:

☐ Inspection/Test Data Attached (Data Sheet To Include: Part Name, Part No., Date, & Sheet \_\_\_\_ of \_\_\_\_)

ITEM	CHARACTERISTIC/REQUIREMENT	INSP. / REJ.	INSPECTOR'S SIGNATURE/LIFE #	DATE
1	moved x stage motor	1 / 0	Caran Weiland Q6498	02/02/18
2	moved y stage motor	1 / 0	Caran Weiland Q6498	02/02/18
3	moved z stage motor	1 / 0	Caran Weiland Q6498	02/02/18
4				
5				
6				
7				
8				
9				

Record all nonconformances for each item on page 2 of ITR.

Qty. Accepted \_\_\_\_\_ Serial (LOT) No. Accepted \_\_\_\_\_